



Feasibility of Producing Winter Greens and Herbs in Greenhouses

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The goal:

Our overall objective is to investigate the feasibility of profitably producing greens and herbs in underutilized greenhouses during winter months. During the “winter” months from November through February, both heat and light limit crop productivity. We know that supplemental heat and light increase growth rate and yields of greens and herb crops, but both heat and light are expensive.

Does it pay to provide supplemental heat and/or light?
Which varieties *and* which species are most tolerant of low light and/or temperature conditions?
In benchtop production, which media and/or fertility regimes make the most sense?

Our Preliminary Experiments

In September 2010, we initiated pilot experiments with three planting dates (2 weeks apart) for each of twelve (12) different varieties/species:

Arugula, Early Mizuna, Purple Mizuna, Endive ‘Rhodos’, Endive ‘Bianca Riccia’, Kale ‘Red Russian’, Lettuce ‘Five Star Greenhouse Mix’, Lettuce ‘Tango’, Mache ‘Vit’, Mache ‘Jade’, Tokyo Bekana, Tatsoi, and Spinach ‘Space’.

All species were seeded in trays (13”x17”) filled with Fort Vee Potting Mix (VT Compost). Seeds were planted in 8 rows spaced 2” apart, with 15-25 seeds (depending on seed size) per row. Harvest weight and leaf length were recorded weekly throughout the fall, concluding Dec 20.

The experiment was duplicated in two greenhouses; with minimum temperatures at 60F and 40F, respectively. Both greenhouses were identical 30x60 structures with inflated double-poly covering. Fuel usage in each house was noted twice a week, to permit us to estimate fuel costs for each planting. To do this, we assumed that the greenhouse was entirely full and a fuel oil price of \$3 per gallon.

We are currently repeating these experiments with February-March seeding dates.

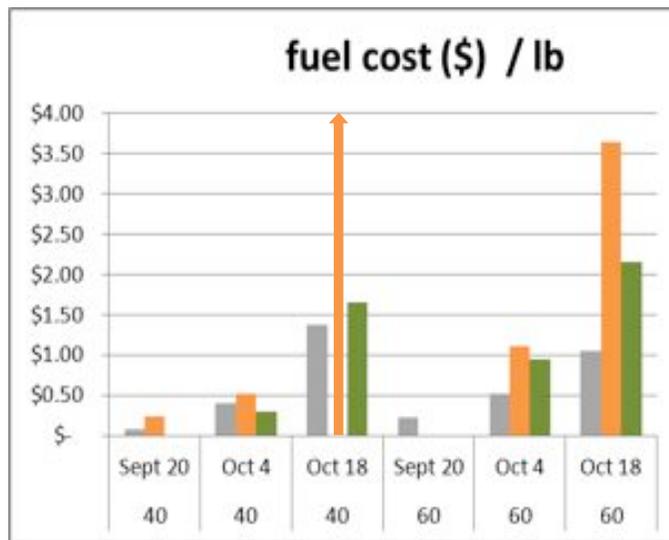
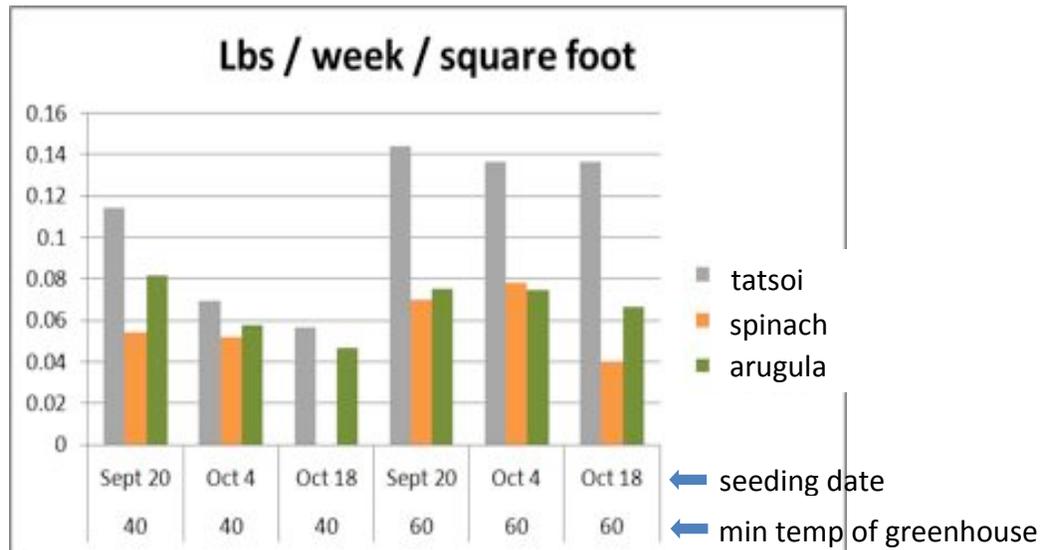
Preliminary results

We were able to calculate for all species in both 40F and 60F houses:

- the number of weeks to harvest maturity, and how this varies with seeding date
- how long the greens could be harvested until they exceeded marketable size as mesclun mix (4” length)
- the maximum harvest weight per square foot
- the amount of fuel used to produce each harvest.



From this, we were able to produce the following types of data:



Thus far, we have learned that some species seem to be more sensitive to temperature than to light (e.g. Tatsoi); whereas others (e.g. Lettuce) seem to be more sensitive to light than to temperature. This means that slow growth in the fall in some species can be partially overcome by increasing temperature, but not entirely.

Questions that we would like to address in detail include:

- refine information on rate of growth in relating to seeding date for greens species
- compare the costs and results obtained using different types of media and fertilizers
- evaluate the potential for producing herbs (basil, cilantro) in this type of system
- develop production budgets that may be useful for producers

We would welcome feedback from those considering growing or with experience growing winter greens in heated greenhouses about what types of results and information would be most useful to you.

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